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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,382	09/23/2003	Akira Ishii	117231	1934

25944 7590 05/04/2009

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EXAMINER	
VO, QUANG N	

ART UNIT	PAPER NUMBER
2625	

MAIL DATE	DELIVERY MODE
05/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/667,382	ISHII, AKIRA	
	Examiner	**Art Unit**	
	Quang N. Vo	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _04 March 2009_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-15 and 17_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-15 and 17_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/04/09 has been entered.

Response to Arguments

Regarding claim 1, applicant's argument is that Cheng does not disclose the pitch of the two first halftone screens are different as amended in claim 1.

In response: Cheng does not disclose the pitch of the two first halftone screens are different (e.g., a single-cell halftone dot does not necessarily have to be square in shape. In fact, in some cases, it is beneficial to consider a more general single-cell halftone dot shape other than a square, such as, for example, a non-orthogonal parallelogram, paragraph 0044. Note: since the halftone dot shape can be other than a square shape such as non-orthogonal parallelogram shape. Thus in general the first halftone pitch (of Cyan) is different from the second halftone pitch (of Magenta)).

Cheng differs from claim 1, in that he does not explicitly disclose two first screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other.

Ishii' (6,185,014) discloses forming color images by superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone

screens to prevent moire (column 1, lines 5-12, column 2, lines 32-40). Since Ishii' (6,185,014) discloses superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone screens; and a screen angle is the angle between two screen vectors of a halftone screen. Thus to have different screen angle to different halftone screens as disclosed in Ishii' (6,185,014), it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize one of the situations to have different screen angle to different halftone screens is to set screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng to include disclose two first screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other as taught by Ishii' (6,185,014). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng by the teaching of Ishii'(6,185,014) to prevent a moiré phenomenon.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (Cheng) (US 2002/0089708) in view of Ishii (6,185,014).

Regarding claim 1, Cheng discloses an image forming apparatus (e.g., a need for convenient systems and methods for determining the spatial and angular positioning of the halftone dots necessary to avoid moiré patterns, paragraph 0043) for digitally reproducing a color image using a screen set consisting of a halftone screen for each color, the screen set (e.g., an image processor operative to halftone an image so that the image can be rendered without displeasing moiré patterns includes a selected set of halftone screens, paragraph 0016) comprising: a first-color halftone screen having an associated first halftone pitch (e.g., cyan (C) halftone screen with **spatial vectors (basic vectors) V(1c) and V(2c)** and **frequency vectors (screen vectors) F(1c) and F(2c)**, figure 3, paragraph 0052. Note: cyan(C) halftone screen inherently having halftone pitch associated); and a second-color halftone screen having an associated second halftone pitch measured in a corresponding direction to the first halftone pitch (e.g., Magenta (M) halftone screen with **spatial vectors (basic vectors) V(1m) and V(2m)** and **frequency vectors (screen vectors) F(1m) and F(2m)**, figure 3, paragraph 0052. Note: Magenta (M) halftone screen inherently having halftone pitch associated), wherein two first screen vectors, one in each halftone screen (e.g., **F(1c) (screen vector) of Cyan, F(1m) (screen vectors) of Magenta, figure 3, paragraph 0052**), each screen vector being in a spatial frequency domain defined by a basis vector of a halftone dot pattern of the respective halftone screen (e.g., **spatial vectors (basic vectors) V(1c) and V(2c) of Cyan, spatial vectors (basic vectors) V(1m) and V(2m)**

of Magenta, figure 3, paragraph 0052), and two second screen vectors, (e.g., **F(2c) (screen vector) of Cyan, F(2m) (screen vectors) of Magenta, figure 3, paragraph 0052**), each screen vector being in a spatial frequency domain defined by a basis vector of a halftone dot pattern of the respective halftone screen (e.g., **spatial vectors (basic vectors) V(1c) and V(2c) of Cyan, spatial vectors (basic vectors) V(1m) and V(2m) of Magenta, figure 3, paragraph 0052**); and the first halftone pitch differs from the second halftone pitch (e.g., a single-cell halftone dot does not necessarily have to be square in shape. In fact, in some cases, it is beneficial to consider a more general single-cell halftone dot shape other than a square, such as, for example, a non-orthogonal parallelogram, paragraph 0044. Note: since the halftone dot shape can be other than a square shape such as non-orthogonal parallelogram shape. Thus in general the first halftone pitch (of Cyan) is different from the second halftone pitch (of Magenta)).

Cheng differs from claim 1, in that he does not explicitly disclose two first screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other.

Ishii' (6,185,014) discloses forming color images by superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone screens to prevent moire (column 1, lines 5-12, column 2, lines 32-40). Since Ishii' (6,185,014) discloses superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone screens; and a screen angle is the angle between two screen vectors of a halftone screen. Thus to have different screen

angle to different halftone screens as disclosed in Ishii' (6,185,014), it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize one of the situations to have different screen angle to different halftone screens is to set screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng to include disclose two first screen vectors, one in each halftone screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other as taught by Ishii' (6,185,014). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng by the teaching of Ishii'(6,185,014) to prevent a moiré phenomenon.

With regard to claim 2, Cheng discloses wherein first-color halftone screen and second-color halftone screen further satisfy a relationship that first screen vectors are equal in magnitude (e.g., figure 2, paragraph 0046).

With regard to claim 3, Cheng discloses wherein at least one of first-color and second-color halftone screens is a non-orthogonal screen (paragraph 0066).

Regarding claim 4, Cheng discloses the screen set further comprising: wherein a third-color halftone screen (e.g., Yellow halftone screen, paragraph 0101); and a fourth-color halftone screen (e.g., black halftone screen, paragraph 0101), wherein two second screen vectors (e.g., **F(2y) (screen vector) of Yellow, F(2k) (screen vectors) of Black, figure 2, paragraph 0101**), one in each halftone screen, each screen vector

being in a spatial frequency domain defined by a basis vector of a halftone dot pattern of the respective halftone screen (e.g., **spatial vectors (basic vectors) V(1y) and V(2y) of Yellow, spatial vectors (basic vectors) V(1k) and V(2k) of Black, figure 1, paragraph 0101**), and two first screen vectors (e.g., **F(1y) (screen vector) of Yellow, F(1k) (screen vectors) of Black, figure 2, paragraph 0101**), one in each of the third and fourth color halftone screens, each screen vector being in a spatial frequency domain defined by a basis vector of a halftone dot pattern of the respective halftone screen (e.g., **spatial vectors (basic vectors) V(1y) and V(2y) of Yellow, spatial vectors (basic vectors) V(1k) and V(2k) of Black, figure 2, paragraph 0101**).

Cheng differs from claim 4, in that he does not explicitly disclose two first screen vectors, one in each of the third and fourth color halftone screens are parallel to each other, and two second screen vectors, one in each of the third and fourth color halftone screens are not parallel to each other.

Ishii' (6,185,014) discloses forming color images by superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone screens to prevent moire (column 1, lines 5-12, column 2, lines 32-40). Since Ishii' (6,185,014) discloses superimposing images of a plurality of colors one on another by assigned different screen angle to different halftone screens; and a screen angle is the angle between two screen vectors of a halftone screen. Thus to have different screen angle to different halftone screens, it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize one of the situations to have different screen angle to different halftone screens is to set screen vectors, one in each halftone

screen are parallel to each other, and two second screen vectors, one in each halftone screen are not parallel to each other.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng to include two first screen vectors, one in each of the third and fourth color halftone screens are parallel to each other, and two second screen vectors, one in each of the third and fourth color halftone screens are not parallel to each other as taught by Ishii' (6,185,014). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Cheng by the teaching of Ishii'(6,185,014) to prevent a moiré phenomenon.

With regard to claim 5, Cheng discloses wherein second screen vector of first-color halftone screen matches secondary spectra represented by the sum or the difference of two screen vectors of fourth-color halftone screen, and first screen vector of third-color halftone screen matches secondary spectra represented by the sum or the difference of two screen vectors of second-color halftone screen (e.g., figure 3 and 4, paragraphs 0053 - 0054).

With regard to claim 6, Cheng discloses wherein first screen vector of first-color halftone screen, first vector of third-color halftone screen, and second vector of second-color halftone screen form a closed triangle, and second screen vector of first-color halftone screen, first vector of fourth-color halftone screen, and screen second vector of third-color halftone screen form a closed triangle (figure 4, paragraphs 0053-0055).

With regard to claim 7, Cheng discloses wherein second vector of first-color

halftone screen matches either one of two screen vectors of a third-color halftone screen in screen set (e.g., equations (5a) and (5b) can be considered as a general description for the three color moiré free condition, which can include all other possible combination..., paragraphs 0053-0055).

With regard to claim 8, Cheng discloses wherein a secondary spectrum represented by the sum or the difference of the two screen vectors of first-color halftone screen matches either one of two screen vectors of a fourth-color halftone screen in screen set (e.g., equations (5a) and (5b) can be considered as a general description for the three color moiré free condition, which can include all other possible combination..., paragraphs 0053-0055).

With regard to claim 9, Cheng discloses wherein screen set comprises four color halftone screens, and the four color halftone screens have a relationship that two closed triangles can be formed using two screen vectors of each of the four color halftone screens, without a remainder (e.g., equations 5(a) and 5(b) can be considered as a general description for the three color moiré free condition, which can include all other possible combinations..., paragraph 0055).

With regard to claim 10, Cheng and Ishii'(6,185,014) combined, discloses wherein in a case where directions of halftone dot arrangement match between first-color and second-color halftone screens, halftone dot intervals in the matched direction of the first-color halftone screen differ from the halftone dot intervals in the matched direction of the second- color halftone screen (e.g., different non-parallelogram shaped dots: squares, rectangles, ellipses, etc. can be superimposed for halftone screens,

Cheng’s paragraph 0051; and different halftone screens are set at different angles Ishii’s column 2, lines 32-40. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have recognized the halftone dots intervals in the matched direction of the first color halftone screen generally differ from the halftone dot intervals in the matched direction of the second-color halftone screen).

With regard to claim 11, Cheng discloses wherein screen set comprises four color halftone screens (e.g., with a fourth respective color separation, paragraph 0017), and among a total of 8 primary spatial frequency spectra each corresponding to one of the screen vectors (e.g., each halftone screen has 2 frequency vectors (screen vectors), figure 2; in the case of four halftone screen, there will be 8 screen vectors for a total of 8 primary spatial frequency spectra) for each color and a total of 8 secondary spatial frequency spectra each corresponding to the sum or the difference of the screen vectors for the same color (e.g., sum and different of the screen vectors equations 5a-5d and include all other possible combination, paragraphs 0055, 0056), the number of different spatial frequency spectra contained in a band of from the minimum frequency to the maximum frequency of 8 primary spatial frequency spectra is less than 8 (Note: since Cheng discloses four color halftone screens with 2 frequency vectors (screen vectors) and include all other possible combinations of sum and differences of frequency vectors (screen vectors). Therefore the number of different spatial frequency spectra contained in a band of from the minimum frequency to the maximum frequency of 8 primary spatial frequency spectra must be less than 8 as claimed in claim 11).

With regard to claim 12, Cheng discloses wherein screen set comprises four

halftone screens (e.g., with a fourth respective color separation, paragraph 0017), one for each color, and among a total of 8 primary spatial frequency spectra, each corresponding to one of the screen vectors (e.g., each halftone screen has 2 frequency vectors (screen vectors), figure 2; in the case of four halftone screen, there will be 8 screen vectors for a total of 8 primary spatial frequency spectra) for each color and a total of 8 secondary spatial frequency spectra, each corresponding to the sum or the difference of the screen vectors for the same color (e.g., sum and different of the screen vectors equations 5a-5d and include all other possible combination, paragraphs 0055, 0056), the number of different spatial frequency spectra contained in a band of from the minimum frequency to the maximum frequency of 8 primary spatial frequency spectra is 6 (Note: since Cheng discloses four color halftone screens with 2 frequency vectors (screen vectors) and include all other possible combinations of sum and differences of frequency vectors (screen vectors). Therefore the number of different spatial frequency spectra contained in a band of from the minimum frequency to the maximum frequency of 8 primary spatial frequency spectra must be less than 8 as claimed in claim 12).

Referring to claim 13:

Claim 13 is the method claim corresponding to operation of the device in claim 1 with method steps corresponding directly to the function of device elements in claim 1. Therefore claim 13 is rejected as set forth above for claim 1.

Referring to claim 14:

Claim 14 is the method claim corresponding to operation of the device in claim 2 with method steps corresponding directly to the function of device elements in claim 2. Therefore claim 14 is rejected as set forth above for claim 2.

Referring to claim 15:

Claim 15 is the method claim corresponding to operation of the device in claim 3 with method steps corresponding directly to the function of device elements in claim 3. Therefore claim 15 is rejected as set forth above for claim 3.

Regarding claim17, Cheng discloses wherein said first-color and second-color halftone screens are an orthogonal screen and a non-orthogonal screen (e.g., a single-cell halftone dot does not necessarily have to be square in shape. In fact, in some cases, it is beneficial to consider a more general single-cell halftone dot shape other than a square, such as, for example, a non-orthogonal parallelogram, paragraph 0044. Note: Since the halftone dot shape can be square (orthogonal) in shape or non-orthogonal in shape. Thus the first color screen (Cyan) can be in square shape (orthogonal) and the second screen (Magenta) can be non-orthogonal).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang N. Vo whose telephone number is (571)270-1121. The examiner can normally be reached on 7:30AM-5:00PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571)272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Q. N. V./
Examiner, Art Unit 2625

/David K Moore/

Supervisory Patent Examiner, Art Unit 2625